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EXAMINER	
WOODS, ERIC V	

ART UNIT	PAPER NUMBER
2628	

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/071,670	KELLMAN ET AL.	
	Examiner	Art Unit	
	Eric Woods	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5-8,12,13,26-29 and 39-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5-8,12,13,26-29 and 39-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, see claim amendments and Remarks pages 1-7, filed 5 September 2006, with respect to the rejection(s) of various claims under 35 USC 103(a) and 35 USC 112, second paragraph have been fully considered and are persuasive.

The rejections of claims 2-4, 8-11, 14-18, 22-25, 30-34, and 38 under 35 USC 103(a) stand withdrawn since those claims have been canceled.

The rejection of claims 5-8, 12-13, and 26-29 under 35 USC 103(a) stand withdrawn in view of applicant's amendments to those claims.

The rejection of claim 11 under 35 USC 112 stands withdrawn since that claim was canceled.

The objections to claims 11 and 12 stand withdrawn since claims 9 and 11 were canceled, leaving only claim 12, so there is no duplication of claims.

Claims 39-44 were added.

However, upon further consideration, new grounds of rejection follow below against the remaining claim(s) in view of various references.

It is noted that applicant's representative alleges on page 4 of Remarks (labeled "Page 11 of 14" at the bottom) that examiner's argument that a certain feature is merely a matter of design choice (e.g. failure to show criticality) is not valid because even small perceptual differences can be critical for improving safety, etc.

It is noted that any allegation of unexpected results via a modification must be backed with a showing of evidence to this effect. There have been no affidavits

submitted under 37 CFR 1.132 containing such evidence. Additionally, while the above allegation may or may not be correct, it is nonetheless an allegation by counsel, wherein the Office via *In re Geisler* does not give statements by counsel probative weight in this regard (e.g. they cannot be regarded as objective evidence).

Examiner respectfully disagrees with applicant's assertion that Hancock and Azuma are directed to different problem solving areas. One of ordinary skill in the art of displaying the location of aircraft on a display device, where such locations represent three-dimensional coordinates, would logically turn to systems that show such information regardless of whether or not they are meant for ground-based air traffic control or airborne aircraft displays. There are many systems that are well known in the art (e.g. military E-3A AWACS platforms) that are airborne platforms that handle air traffic control and coordination of aircraft. As such, one of ordinary skill in the art would look to such displays as well. In the underlined summary at the bottom of page 5 and the top of page 6 of Remarks, the only difference noted between the two references is that Azuma attempts to present **easily readable aircraft altitude information to an air traffic controller**, wherein Hancock attempts to present **easily readable relative aircraft altitude information to an aircraft pilot**. The only difference in the bolded statements by applicant is the end user of the system (intended use rationale), and that one displays "altitudes" and the other displays "relative altitudes". The differences between them are therefore not significant.

Claim Objections

Claim 13 stands objected to because of the following informalities: at the end of the line "correlating the first and second coordinates (x, y) with a location of an icon in a display" there is a semicolon and the recitation "and". The "and" is unnecessary and grammatically incorrect, since there are two other clauses and at least one other "and" below it. Appropriate correction is required.

Claim 13 is also objected to because the line recited above states "an icon *in* a display", wherein an icon can be displayed *on* a display but is not *in* the display.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> **The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.**

Claim 12 stands rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the claim recites functional limitations that render the metes and bounds of the claim unclear. Specifically, the "adapted to" language is indefinite. That language makes it unclear whether or not the recited component in fact must perform the recited function or have the recited element(s) or functionality.

Claims 42-44 are rejected as not correcting the deficiencies of their parent claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 5-8, 12-13, 26-29, and 39-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Azuma et al ("Visualization Tools for Free Flight Air-Traffic Management") in view of Hancock (US 5,179,377) and Staggs et al (US 6,433,729 B1).

As to claim 12,

A system for conveying aircraft altitude to a human observer, comprising: (Azuma Figures 3 and 4, shown on a display device)

-A processor adapted to receive latitude, longitude, and altitude information, wherein the altitude information corresponds to an altitude of the aircraft relative to a geographic reference, (Azuma teaches processor in the form of a SGI Onyx with 4 R10K CPUs on page 34, lower left column. Azuma teaches that the system receives such 3D coordinate information (e.g. page 33, "All aircraft are tracked with an augmented GPS, such as the Wide Area Augmentation System (WAAS), and broadcast their positions

and intended routes... via a data link such as ADS-B", and the altitude information is provided with respect to a geographic reference, e.g. sea level and/or airport altitude)

-Wherein the processor is further adapted to covert the altitude information to an icon having a shape that changes in response to the altitude information; and (Azuma teaches a processor that converts that altitude information of the of the system to an icon that has changes color in response to the altitude information, e.g. page 34, upper right column, "Aircraft icons are colored based on direction and latitude. Eastbound aircraft are orange, and westbound aircraft are blue, with lighter hues indicating higher altitudes.")

-A display coupled to the processor, wherein the processor is further adapted to represent the icon on the display at a position on the display indicative of the latitude and the longitude, wherein the icon represented on the display has the shape, which is indicative of the altitude of the aircraft relative to the geographic reference. (Azuma teaches display devices on page 34, lower left column, where such is obviously coupled to the display device since it displays the output. In Figures 3-4, the aircraft are represented as icons having the recited latitude and longitude positions, where the icon changes color in a manner indicative of the attitude of the aircraft.)

Azuma teaches most of the limitations of the instant claim but fails to teach changing the shape of the icon in a manner indicative of the received altitude. The Hancock reference clearly teaches that icons are changed in size and shape (e.g. overlaid threat symbol) with respect to each other when they are close to each other

(e.g. the distance between the aircraft is sufficient to cause a traffic and/or resolution advisory) – see Hancock, Figures 1 and 2 – the icon size is clearly changed as the differential altitude changes –see 2:50-55, 3:35-50). The Hancock reference further teaches that it is advisable to have redundant coding (e.g. different color, size, and overlaid threat symbol) for an icon representing the aircraft. Note that Hancock clearly teaches that the size of the icon varies with respect to differential altitude (4:6-35 for Figure 2, with the icon size varying with the relative location of other planes to the present location of the aircraft). See also Abstract.

Hancock also teaches overlaying different threat symbol classes on aircraft (e.g. 4:65-5:12) based on their altitude and/or distance to current position, where further the aircraft have triangles on their wing tips that change based on altitude (e.g. a descending aircraft has the triangles 70 applied to the wing tips in Figure 3), where if the aircraft ascend the triangles point up, etc. Clearly, Hancock could be read to suggest changing the shape of the icon based on the altitude information.

However, Hancock fails to expressly teach changing the shape of the aircraft per se, while suggesting **tagging** the aircraft icon with a symbol that changes based on advisory warning, and attaching the triangles to indicate vertical trend directions.

Stagg et al teaches that (9:55-67, 17:40-67, Figures 6A-6C, 9A-11B) that changing the actual **shape** of the icon is the most effective manner to indicate warning position, rather than simply tagging the plane-shaped icon.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Azuma to change the shape of an icon to

present altitude information, since Hancock clearly teaches that redundant coding is a good idea so that the air traffic controller can more easily determine the altitude of an aircraft at a glance in a 2D plan view rather than a 3D perspective view, and so that the information is more accurately conveyed – visual redundancy does this, and Stagg clearly provides that changing the shape improves visual redundancy and is better for obtaining user attention (9:55-67) than purely tagging the differentially sized icon with the traditional air traffic control symbol. Also, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a linear increase in size rather than specific, discrete sizes because it would more easily convey the information to the user (since Azuma uses a monotonically varying, correlated quantity to determine icon hue, and since the shape is only being used to provide redundant information coding as specified in Hancock).

As to claim 13,

A method of conveying location of an object, comprising: (Azuma uses a computer to convey such information, see Figures 3 and 4)

-Receiving latitude, longitude, and altitude information regarding the object, the location information including a first coordinate *x*, a second coordinate *y*, and a third coordinate *z*, wherein the third coordinate z represents an altitude of the object relative to a geographic feature; (Azuma teaches processor in the form of a SGI Onyx with 4 R10K CPUs on page 34, lower left column. Azuma teaches that the system receives such 3D coordinate information (e.g. page 33, "All aircraft are tracked with an augmented GPS,

such as the Wide Area Augmentation System (WAAS), and broadcast their positions and intended routes... via a data link such as ADS-B", and the altitude information is provided with respect to a geographic reference, e.g. sea level and/or airport altitude)

-Correlating the first and second coordinates (*x*, *y*) with a location of an icon on the display; and (Azuma teaches such (x, y) coordinates shown on the display as in Figure 3)

-Correlating the third coordinate *z* with a shape of the icon, wherein the icon shape changes in response to changes in the third coordinate *z*; and (Azuma teaches a processor that converts that altitude information of the of the system to an icon that has changes color in response to the altitude information, e.g. page 34, upper right column, "Aircraft icons are colored based on direction and latitude. Eastbound aircraft are orange, and westbound aircraft are blue, with lighter hues indicating higher altitudes.")

-Displaying the icon on the display, wherein the displayed icon has the shape that changes in response to changes in the third coordinate z, and where the displayed icon has a position on the display indicative of the first and second coordinates (*x*, *y*). (Azuma teaches display devices on page 34, lower left column, where such is obviously coupled to the display device since it displays the output. In Figures 3-4, the aircraft are represented as icons having the recited latitude and longitude positions, where the icon changes color in a manner indicative of the attitude of the aircraft.)

Azuma teaches most of the limitations of the instant claim but fails to teach changing the shape of the icon in a manner indicative of the received altitude. The Hancock reference clearly teaches that icons are changed in size with respect to each

other when they are close to each other (e.g. the distance between the aircraft is sufficient to cause a traffic and/or resolution advisory) – see Hancock, Figures 1 and 2 – the icon size is clearly changed as the differential altitude changes –see 2:50-55, 3:35-50). The Hancock reference further teaches that it is advisable to have redundant coding (e.g. different color, size, and overlaid threat symbol) for an icon representing the aircraft. Note that Hancock clearly teaches that the size of the icon varies with respect to differential altitude (4:6-35 for Figure 2, with the icon size varying with the relative location of other planes to the present location of the aircraft). See also Abstract.

Hancock also teaches overlaying different threat symbol classes on aircraft (e.g. 4:65-5:12) based on their altitude and/or distance to current position, where further the aircraft have triangles on their wing tips that change based on altitude (e.g. a descending aircraft has the triangles 70 applied to the wing tips in Figure 3), where if the aircraft ascend the triangles point up, etc. Clearly, Hancock could be read as suggesting changing the shape of the icon based on the altitude information.

However, Hancock fails to expressly teach changing the shape of the aircraft per se, while suggesting **tagging** the aircraft icon with a symbol that changes based on advisory warning, and attaching the triangles to indicate vertical trend directions.

Stagg et al teaches that (9:55-67, 17:40-67, Figures 6A-6C, 9A-11B) that changing the actual **shape** of the icon is the most effective manner to indicate warning position, rather than simply tagging the plane-shaped icon.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Azuma to change the shape of an icon to

present altitude information, since Hancock clearly teaches that redundant coding is a good idea so that the air traffic controller can more easily determine the altitude of an aircraft at a glance in a 2D plan view rather than a 3D perspective view, and so that the information is more accurately conveyed – visual redundancy does this, and Stagg clearly provides that changing the shape improves visual redundancy and is better for obtaining user attention (9:55-67) than purely tagging the differentially sized icon with the traditional air traffic control symbol. Also, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a linear increase in size rather than specific, discrete sizes because it would more easily convey the information to the user (since Azuma uses a monotonically varying, correlated quantity to determine icon hue, and since the shape is only being used to provide redundant information coding as specified in Hancock).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Azuma to change the size of an icon to present altitude information, since Hancock clearly teaches that redundant coding is a good idea so that the air traffic controller can more easily determine the altitude of an aircraft at a glance in a 2D plan view rather than a 3D perspective view, and so that the information is more accurately conveyed – visual redundancy does this. Also, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a linear increase in size rather than specific, discrete sizes because it would more easily convey the information to the user (since Azuma uses a monotonically

varying, correlated quantity to determine icon hue, and since the shape is only being used to provide redundant information coding as specified in Hancock).

As to claim 26, Hancock teaches a limited number of discriminably different sizes (e.g. 3)(3:5-4:55).

As to claim 27, clearly Azuma teaches a continuously variable relationship between hue and altitude, and following that logic (if size is replaced for hue), then continuous variability would be obvious. Also, size is easier to discriminate than hue if the operator of such a system is under high cognitive workload (this is well known in the art), which provides the motivation for replacing hue with size. Also, Hancock clearly points out that size is preferred, given that Figures 1 and 2 illustrate variation and proximity by means of changing the size of an icon.

As to claims 28 and 29, the rejection to claim 14 above is incorporated by reference in its entirety. Azuma clearly teaches that a desired characteristic correlates with a higher value of the third coordinate – that is, the characteristic (grayscale, e.g. level of hue) changes monotonically with the value of the third coordinate (e.g. altitude). It would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to vary such other characteristics as might be linked to the third coordinate in a similar manner.

The only difference between claims 28 and 29 is that the altitude is correlated with either a smaller or larger size (e.g. the size changes in one direction or the other). The direction of shift (e.g. that the aircraft gets larger with increasing altitude, or vice

versa) is obviously not critical (since applicant is claiming it is implemented in both directions), and applicant has demonstrated no criticality otherwise. Choosing which direction the scaling would occur would therefore be a matter of user choice and/or preference. Therefore, since the direction of change is not important but rather the knowledge of what the change means (e.g. that lighter color is higher or lower, or that bigger is higher or lower) is the critical portion, it is a matter of user preference.

As to claim 39, clearly as noted above Hancock changes the size of the icon with respect to the altitude or changes in the third coordinate z, where the changed icon is updated on the display as discussed above.

As to claim 40, this is very similar to claim 39 except that the word 'color' was replace with 'size'. Azuma fails to teach this limitation expressly (although the change in hue of the icon as on page 34 in the upper right hand column could be regarded as a change in color), while Hancock clearly changes the color of the icon with respect to altitude as discussed in (Abstract, 2:30-47, 3:40-50) with the triply redundant coding and the like. Motivation is taken from the rejection to the parent claim.

As to claim 41, Azuma clearly changes varying the hue of the icon. Azuma clearly shows in Figures 3 and 4 various two- and three-dimensional views of icons. These icons are specified to change **hue** with altitude, that is: "...lighter hues indicating higher altitudes..." (Azuma page 34, right hand column, top paragraph). This clearly constitutes a monotonic change in intensity of an icon (since the lightness of a hue corresponds to grayscale and/or intensity change of an icon with respect to altitude).

As to claim 42, this is a system claim comparable to the method equivalent in the rejection to claim 39 above, where that is incorporated by reference.

As to claim 43, this is a system claim comparable to the method equivalent in the rejection to claim 40 above, where that is incorporated by reference.

As to claim 44, this is a system claim comparable to the method equivalent in the rejection to claim 41 above, where that is incorporated by reference.

As to claim 5, this is a system claim comparable to the method equivalent in the rejection to claim 26 above, where that is incorporated by reference.

As to claim 6, this is a system claim comparable to the method equivalent in the rejection to claim 27 above, where that is incorporated by reference.

As to claims 7-8, these are system claims comparable to the method equivalents in the rejections to claims 28-29 above, where those are incorporated by reference.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Woods whose telephone number is 571-272-7775. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Eric Woods

November 8, 2006

ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER